

CLAIMS:

1. A method of recovering metals and minerals from aqueous media, comprising:
contacting an aqueous medium comprising at least one metal or mineral an eucaryotic
aquatic organism capable of concentrating the metal or mineral, to concentrate the metal or
5 mineral in the organism; and
recovering the concentrated metal or mineral from the organism.
2. The method of Claim 1, wherein the aqueous medium is seawater.
3. The method of Claim 2, wherein the metal or mineral is gold.
4. The method of Claim 1, wherein the eucaryotic organism harbors a microorganism
10 capable of concentrating the metal or mineral.
5. The method of Claim 2, wherein the metal or mineral concentrated in the
microorganism is also recovered.
6. A method of recovering metals and minerals from aqueous media, comprising:
contacting an aqueous medium comprising at least one metal or mineral with an
15 eucaryotic aquatic organism which harbors a microorganism capable of concentrating the
metal or mineral, to concentrate the metal or mineral in the microorganism; and
recovering the concentrated metal or mineral from the microorganism.
7. The method of Claim 6, wherein the eucaryotic aquatic organism is an invertebrate.
8. The method of Claim 6, wherein the invertebrate is selected from the group
20 consisting of sponges, mollusks, tube worms, marine annelids and polyps.
9. The method of Claim 8, wherein the invertebrate is a sponge.

10. The method of Claim 9, wherein the microorganism is transformed by the insertion of at least one heterologous gene, wherein the gene is expressed and the expression product is capable of concentrating the metal or mineral in the microorganism.

11. The method of Claim 10, wherein the microorganism is a bacteria.

12. The method of Claim 11, wherein the aqueous medium is seawater.

13. The method of Claim 12, wherein the metal or mineral is gold.

14. A transgenic eucaryotic aquatic organism which is capable of concentrating at least one metal or mineral from an aqueous medium and expresses at least one heterologous gene which encodes a protein that effects the concentration of the metal or mineral in the organism.

15. A eucaryotic aquatic organism which harbors a microorganism that is capable of concentrating at least one metal or mineral from an aqueous medium.

16. A transgenic eucaryotic aquatic organism which is capable of concentrating at least one metal or mineral from an aqueous medium, expresses at least one heterologous gene which encodes a protein that effects the concentration of the metal or mineral in the organism, and harbors a microorganism that is capable of concentrating the metal or mineral from an aqueous medium.

17. A method of concentrating metals and minerals from aqueous media, comprising: contacting an aqueous medium comprising at least one metal or mineral with the organism of Claim 14, to concentrate the metal or mineral in the organism.

18. A method of concentrating metals and minerals from aqueous media, comprising: contacting an aqueous medium comprising at least one metal or mineral with the organism of Claim 15, to concentrate the metal or mineral in the microorganism.

19. A method of concentrating metals and minerals from aqueous media, comprising:
contacting an aqueous medium comprising at least one metal or mineral with the
organism of Claim 16, to concentrate the metal or mineral in the organism and the
microorganism.

20. A method of recovering metals and minerals from aqueous media, comprising:
contacting an aqueous medium comprising at least one metal or mineral with the
organism of Claim 14, to concentrate the metal or mineral in the organism; and
recovering the concentrated metal or mineral from the organism.

21. A method of recovering metals and minerals from aqueous media, comprising:
contacting an aqueous medium comprising at least one metal or mineral with the
organism of Claim 15, to concentrate the metal or mineral in the microorganism; and
recovering the concentrated metal or mineral from the microorganism.

22. A method of recovering metals and minerals from aqueous media, comprising:
contacting an aqueous medium comprising at least one metal or mineral with the
organism of Claim 16, to concentrate the metal or mineral in the organism and the
microorganism; and
recovering the concentrated metal or mineral from the organism and the
microorganism.